

TITLE OF THE INVENTION

PLASMA PROCESSING SYSTEM IN WHICH WAFER IS RETAINED BY ELECTROSTATIC
CHUCK, PLASMA PROCESSING METHOD AND METHOD OF MANUFACTURING
SEMICONDUCTOR DEVICE

One
07/11/66

5

Background of the Invention

1. Field of the Invention

The present invention relates to a plasma processing system, and to a plasma processing method, and to a method of manufacturing a semiconductor device using the plasma processing system and method. More particularly, the present invention relates to a method of manufacturing a semiconductor device in which a wafer is chucked and secured by utilization of an electrostatic chuck.

15 2. Description of the Background Art

A method of manufacturing an integrated circuit called an IC or a LSI usually employs an etching process in a process of forming a pattern. In a system to be used for the etching process, there has been employed an electrostatic chuck for securing a wafer to an electrode. The wafer is secured by means of utilizing an electrostatic force developing in the electrode. The electrostatic force is generated by means of applying a high frequency, such as microwaves, to the inside of a processing chamber where the wafer is to be processed.

Fig. 3 is a view for describing the structure of a conventional plasma processing system (wafer etching system).

In Fig. 3, reference numeral 1 designates a wafer. For instance, there is used a Si wafer 8 inches in diameter as the wafer 1. Although not shown, a film to be etched, for example, an oxide film (SiO_2) is formed on the wafer 1. Reference numeral 2 designates an insulating coating placed on a power electrode 3 disposed in a processing chamber (not shown). The wafer 1 is to come into contact with the insulating coating 2. For instance, a film containing titania or alumina is used as material of the insulating coating 2. The power electrode 3 chucks and retains the wafer 1 thereon by way of the insulating coating 2. For instance, an aluminum alloy A5052 is used as material for the power electrode 3. Reference numeral 4 designates a matching circuit for matching the voltage of a high-frequency power supply 5 and the voltage applied to the power electrode 3.

The high-frequency power supply 5 produces a voltage for producing plasma to be used for effecting an etching reaction. Further,

RECORDED - INDEXED - FILED